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â€œBioethanol can do a world of good if produced sustainablyâ€?

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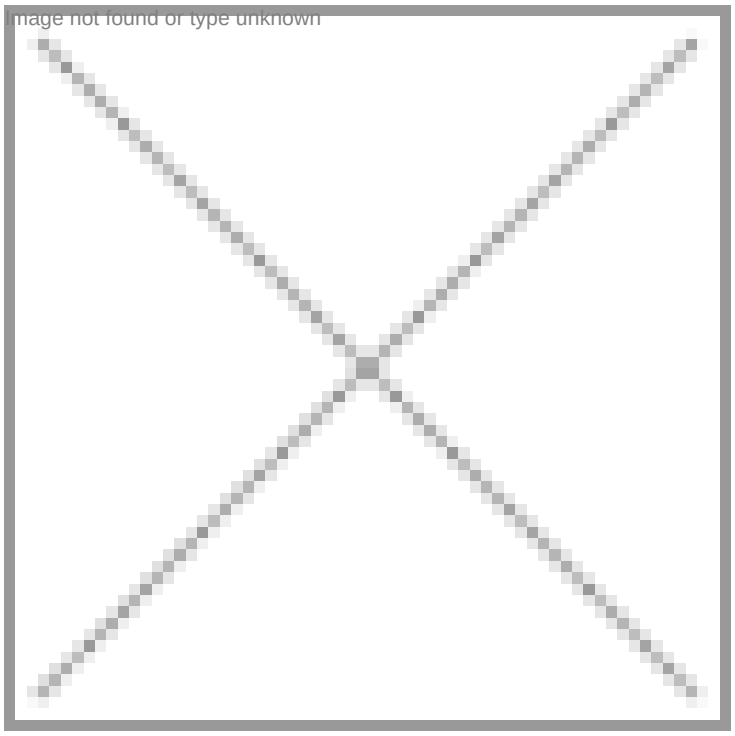
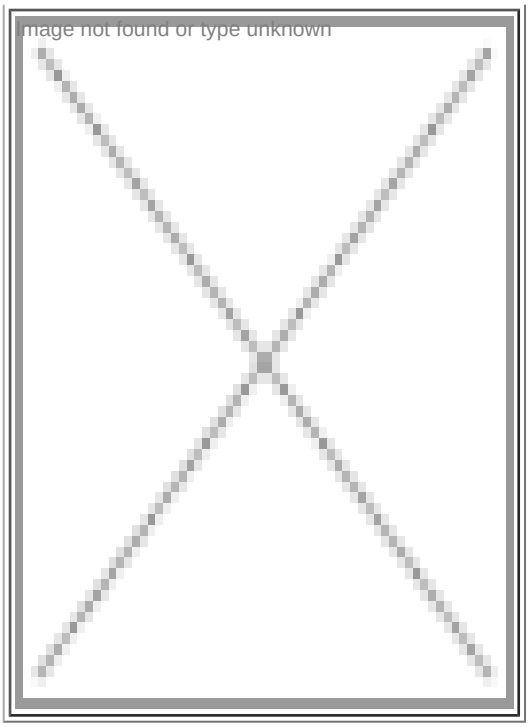


“Bioethanol can do a world of good if produced sustainably”

—Peder Holk Nielsen, executive vice president, enzyme business, Novozymes A/S, Denmark



Peder Holk Nielsen, joined Novo Industri A/S in 1984 as an assistant product manager in the Enzymes Division, and has served the organization in various roles before being appointed as director of the New Business Development Group in 1988. He was appointed as vice president of Industrial Biotechnology in 1990 and as vice president of R&D in the Enzyme Process Division in 1993. And between December 1994 and December 1998 he was corporate vice president of Enzyme Development and Applications. In 2000, Nielsen was appointed as executive vice president, business operations in Novozymes and in 2007 he was appointed as head of Enzyme Business.
Peder Holk Nielsen was recently in India to be a part of the silver jubilee celebrations of the company's operations in India. Nielsen shares his view on the various opportunities in the enzymes business.

What are some of the characteristics of the Novozymes' story?
This company has made a significant commitment over the past few years to becoming more customer-centered. Yes, that sounds like a cliche, but for us it is the main reason why Novozymes has become an independent company. The old structure, where we were a business division of Novo Nordisk, made sense as long as the challenge was to exploit a common production technology to the maximum. But the business has changed, and our new structure gives us far more freedom to find strategic partners. The way we carry out our business is through long-term commitment. The culture of this company is being customer-oriented and everybody including production and R&D understand that serving customers is the way of life. We imagine a future where our biological solutions create the necessary balance between better business, cleaner environment and better lives.

You are celebrating 25 years of successful operations in India. Can you trace the journey?
Novozymes has had a presence in the Indian market for a long time. As far back as 1983, the first enzyme activities were established in Bangalore. In 1992, we expanded as a wholly owned subsidiary of Novozymes A/S and had six people in India chasing big dreams. The Novozymes' Indian headquarters is in the International Technology Park, Bangalore, and we also have production and repackaging facilities at other locations in Bangalore. We also started R&D in 2005. The year 2007 has been a landmark year for Novozymes in India. We acquired Biocon Ltd's enzyme activities and strengthened our operations and resources. That was one of the largest acquisitions for Novozymes. With it, our position and opportunity for harnessing the rapid growth in the Indian market has become even stronger. Today we have around 235 people in the India operations.

What are your observations on the enzymes business opportunities in India and Asia?
The use of enzymes is still limited in the country, but India's increasing prosperity offers good potential for growth. Biocon's enzyme activity acquisition has made our position strong in the Indian enzyme market with a good distribution network and channels, local application knowledge and a global position in enzymes for the wine and juice industries. Although the use of enzymes is still at a relatively low level, interest in the benefits of using enzymatic solutions in India is intensifying. In India, the laundry, alcohol and textiles industries are using enzymes and there are going to be newer applications too. Asia is growing in importance for Novozymes and the sales in the region have grown by an average of 10 percent per annum over the past few years. The opportunity can be gauzed by looking through the eyes of the customers. There is a lot of excitement

in significant markets like Asia. China, India, and South East Asia.

There is a lot of activity in the biofuels sector. Can you comment on some of your initiatives?

Novozymes uses biotechnology to improve the use of resources in more than 30 industries around the world. The biofuel industry is one of them. Novozymes sees bioethanol as a major step towards meeting increasing needs with limited resources, if done the right way. Novozymes offers what is likely to be the most efficient technology platform to further improve the sustainability performance of bioethanol production. The use of enzymes in the bioethanol industry is a mature and proven technology. Nonetheless, there is still great potential in the use of enzyme technology to further optimize and improve the bioethanol production.

Is bioethanol mature enough to be a major source of biofuel?

Bioethanol is based on renewable resources and can reduce our dependency on fossil fuel. By 2030 bioethanol can meet 25 percent of the global need for energy for road transport and a lot more as vehicle fuel economy improves. First-generation bioethanol is produced from crops such as sugar cane/beet, corn, wheat, barley, rye, sorghum, and cassava. This technology is in place and all commercial production of bioethanol is currently first generation. Second-generation bioethanol is produced from feedstock containing cellulosic biomass such as the stalks, leaves and husks of corn plants, wood chips, and sawdust. Second-generation bioethanol may also be produced from energy crops such as switch grass. The advantages of energy crops include their need for less fertilizer and the fact that they can be harvested several times a year. Enzyme technology is constantly developing, and Novozymes expects that the enzyme technology for commercially viable production of second-generation bioethanol will be on the market in 2010.

Novozymes was awarded a $12.3 million contract from the US Department of Energy (DoE) to improve the enzymes necessary to produce cellulosic ethanol. Novozymes' project DECREASE (Development of a Commercial-Ready Enzyme Application System for Ethanol) aims to improve the performance of enzyme systems, to further reduce the cost of cellulosic ethanol production and supply new and commercial cellulases in pilot, demonstration, and commercial plants by 2012.

What are some of your initiatives in the biofuel sector in Asia?

The United States, Brazil, and China have defined clear targets and roadmaps for the development of the bioethanolindustry. By 2010 China aims to double its bioethanol production to cover five percent of the total transport fuel used with a target of three million tons of fuel ethanol. China currently produces roughly the same amount of bioethanol as all the EU countries put together, and we expect China to become an important market for enzymes for the production of bioethanol.

As China has to import maize (corn) and cereals for food use, there is a great deal of interest there in developing the technology for producing bioethanol from plant waste (biomass), the second-generation bioethanol. In 2006, Novozymes entered into a three-year cooperation agreement with China Resources Alcohol Corporation (CRAC) for the development of this technology. Among other things, the agreement means that Novozymes and CRAC have created a development team to work at a pilot plant set up specifically for this project.

We inaugurated the world's largest enzyme fermentation facility (Hongda) in China recently. The facility, Suzhou Hongda Enzymes Co., is located in Taicang, Suzhou, Jiangsu Province, about 50 km north of Shanghai. The expanded capacity will primarily focus on products for the bioethanol industry, with the expansion signaling an investment in both bioethanol and the expanding Chinese market. The Hongda facility in Taicang has been expanding and has more than tripled its headcount. The Suzhou facility is one of Novozymes' strategic manufacturing locations, and this new expansion will enable us to accomplish more.

N Suresh and Ch. Srinivas Rao